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(71) Applicant(s)
Roke Manor Research Limited
(Incorporated in the United Kingdom)
Roke Manor, ROMSEY, Hampshire, SO51 0ZN,
United Kingdom

(72) Inventor(s)
Mike Hook
Walter Harold William Tuttlebee
John Steven Cundall

(74) Agent and/or Address for Service
Siemens Group Services Limited
Intellectual Property Department, Siemens House,
Oldbury, BRACKNELL, Berks, RG12 8FZ,
United Kingdom

(54) Abstract Title
Downloading software to mobile telecommunication users

(57) A mobile telecommunications device 16 receives broadcast software and then contacts the network operator 12 responsible for the broadcasting so that the software may be enabled for use. The downloaded software can be new network services, user specified applications software or user specified information. The downloaded software may be written as Java (RTM) classes and capable of running on a virtual Java (RTM) machine. All the Java (RTM) classes can be continuously broadcast at a relatively modest data rate. In an enhanced mode a list of services available for downloading is broadcast over the network more frequently than the services themselves. The user then selects which service is desired and only that one is downloaded. Payment may be on a subscription or a pay-per-use basis. The arrangement may also be adapted for digital broadcasting platforms such as DAB and DVB (Digital Audio Broadcasting and Digital Video Broadcasting respectively).

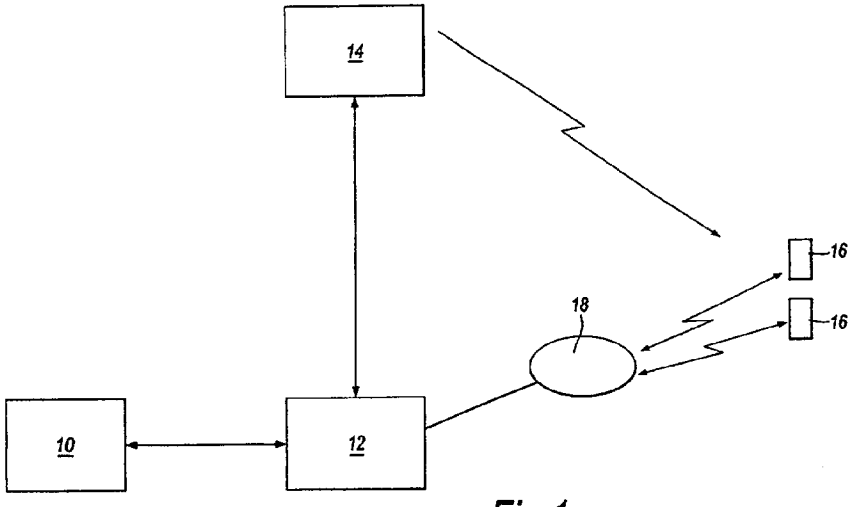

Fig.1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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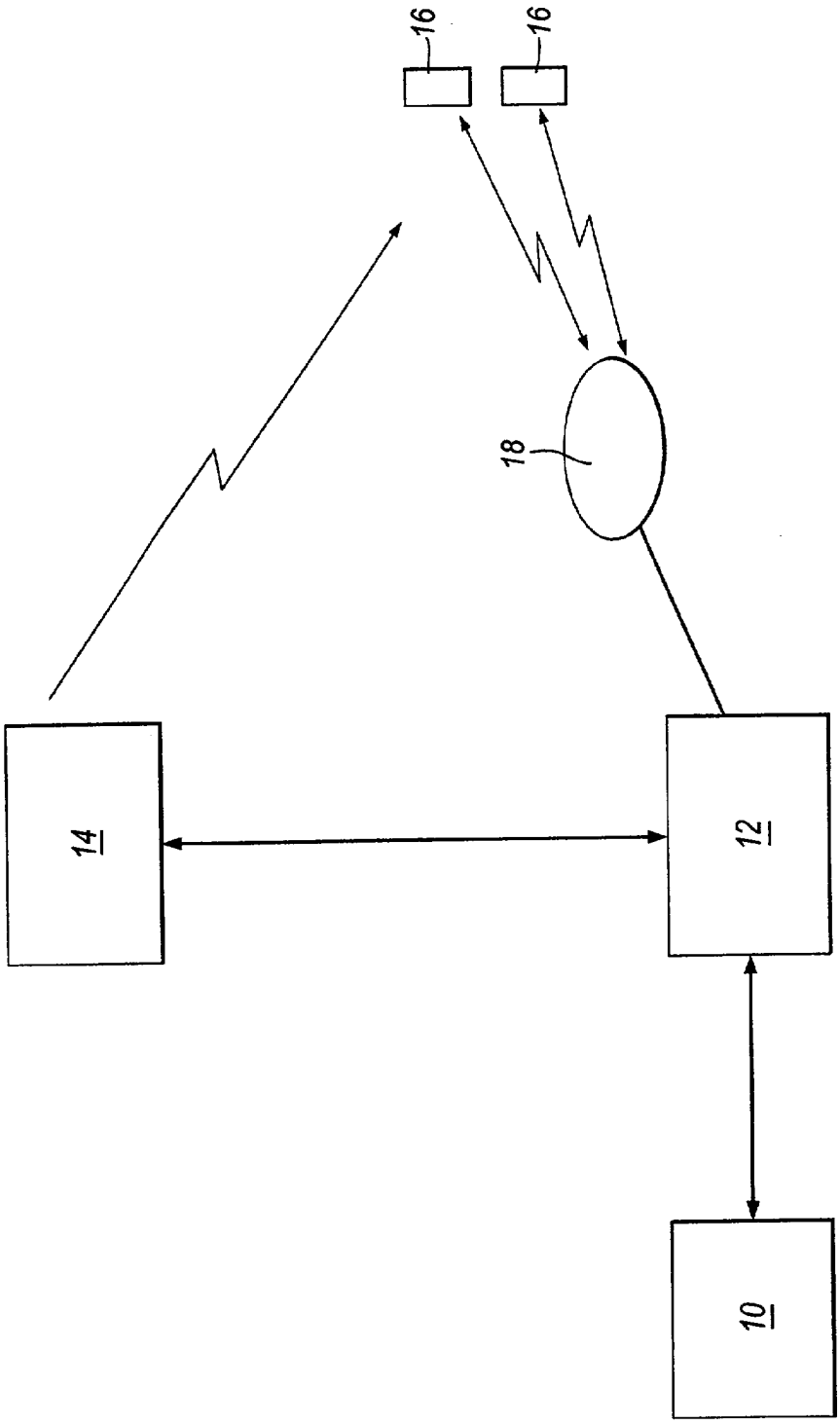

Fig.1

METHOD FOR DOWNLOADING SOFTWARE

The present invention relates to the field of wireless telecommunications.

More specifically, the present invention relates to a method for downloading software to a mobile telecommunications device.

The use of mobile telecommunications and its importance is rapidly increasing in both the private and business sectors. In an effort to attract new customers and to keep existing customers, network operators try to offer a variety of service options. Ideally, network operators would like to be able to introduce new services quickly and to have these services unique to their own networks.

Currently, network operators offer services such as voicemail, address books and up to date information such as stock market quotations. A user selects which services he wants when he chooses his network operator and phone. Other services may be added by contacting his network operator. Services such as stock market quotations are provided by a point to point connection with his network operator. Payment for these services is via the established Global System Mobile (GSM) infrastructure and is reflected on a monthly bill.

The present invention offers a solution to the problem of introducing new services to customers quickly and efficiently.

According to the present invention, there is provided a method for downloading software to a mobile telecommunications device said method including the steps of: broadcasting said software, receiving and

downloading said software to said mobile telecommunications device, contacting a network operator responsible for said broadcasting, and causing said network operator to enable said software such that said software is available for use by a user of said mobile telecommunications device.

According to an aspect of the present invention said step of broadcasting said software is in digital form.

According to a further aspect of the present invention said step of contacting a network operator responsible for said broadcast is via an existing point to point connection.

According to a further aspect of the present invention said step of causing said network operator to enable said software includes a further step of billing said user for said software via said existing point to point connection.

According to yet a further aspect of the present invention said step of contacting a network operator responsible for said broadcast is via an existing GSM connection.

According to a further aspect of the present invention said software is developed using a platform independent object code.

According to yet a further aspect of the present invention said platform independent object code is Java™.

Advantageously, the present invention provides a method whereby mobile network operators can make new services and updated versions of existing services available to existing customers quickly and easily without the need to seek and obtain regulatory permission.

While the principle advantages and features of the present invention has been described above a greater understanding and appreciation of the invention may be obtained by referring to the drawing and detailed description in the preferred embodiment, presented by way of example only, in which;

Figure 1 is a block diagram of the main aspects of the present invention.

In Figure 1, in which a preferred embodiment of the present invention is depicted in block diagram form, a software provider 10 is shown which has a commercial agreement with a network operator 12. The software provider designs and writes application software suitable for use with mobile telecommunications devices such as mobile phones or Personal Digital Assistants (PDAs). The software might be a new service such as voicemail systems or an applications type software package such as a word processor or a spreadsheet. The software might also be information such as a street map or the location of hospitals or police stations.

In this preferred embodiment of the present invention the software is developed using a platform independent object code thus enabling the same software to be used by a wide variety of mobile telecommunications devices. In this preferred embodiment the software is developed using the existing commercially available Java™ language. The software is written as Java™ classes capable of running on a Java™ virtual machine.

The software provider 10 enters a commercial agreement with a network operator 12 to sell or license its software to the network operator either on a fixed price, pay-per-use or other suitable payment scheme.

In order to distribute the software to its existing customers, the network operator 12 enters into a commercial agreement with a broadcaster 14. In this preferred embodiment the broadcaster is a digital broadcaster. A digital broadcaster 14 broadcasts the software using a digital broadcasting platform such as Digital Audio Broadcasting (DAB) or Digital Video Broadcasting (DVB) as a means for delivering the Java™ classes to existing network subscribers 16 of the network operator 12. As will be appreciated by those skilled in the art the existing network subscribers may be using a variety of mobile communication devices such as mobile phone or PDAs.

After downloading the Java™ class of interest, the subscriber 16 then contacts the network operator 12 via a base station 18 to establish a point to point contact with the network operator. In this preferred embodiment the point to point contact is via an existing GSM link. The network operator 12 then transmits an authentication code to the subscriber 16 via a GSM base station 18 which enables the Java™ class software to run. Upon transmission of the authentication code the network operator also arranges for the subscriber to be charged for the service on his monthly bill.

As will be appreciated the method of charging may be on a subscription basis or a pay-per-use basis. The billing information can be contained in the downloaded Java™ class broadcast by the digital broadcaster or can be sent with the authentication code via the point to point contact established between the mobile telecommunications device and the network operator via the existing GSM link.

As will be appreciated by those skilled in the art the point to point contact for authorisation and billing purposes can be established via an

existing mobile telecommunication protocol such as GSM. Alternatively, the point to point contact can be established via a third generation wireless telecommunications protocol such as Universal Mobile Terminal System (UMTS).

In the previously described embodiment of the present invention all Java™ classes are continuously broadcast over the air by the digital broadcaster. If, for example, a relatively modest data broadcast rate of 9,600 bits per second is used, then 100 services each containing 10,000 bytes of data can be fully broadcast approximately every 14 minutes. As will be appreciated, other broadcast rates could be used without departing from the scope of the present invention. New services can then be downloaded to the subscriber's mobile telecommunications device allowing the subscriber to have access to new services on demand.

In an alternative embodiment of the present invention the digital broadcaster continuously broadcasts a list of services available more frequently than the actual services themselves. The subscriber can then view the list via his mobile telecommunications device and decide which services he wants to download. The list may appear in a menu type format. Information can be encoded in a list of services such that when a particular service is selected the mobile telecommunications device automatically downloads that service the next time it is broadcast. This embodiment enables the list to be received by the subscriber more rapidly than the actual services. Once the service of interest is selected the subscriber is free to do other things while the service is automatically downloaded the next time it appears in the broadcast cycle.

In a further embodiment certain high demand services would be broadcast more often in a broadcast cycle than other services of lesser demand. Alternatively, certain priority services would be automatically downloaded immediately upon broadcast, provided sufficient memory is available on the mobile telecommunications device.

An example of a typical operation of a preferred embodiment of the present invention will now be given. The subscriber selects the option on his mobile phone to view the list of services currently available from his network operator. This list, which is continuously broadcast appears on his phone's display screen. The subscriber selects the service that he is interested in using. In response to the subscriber's selection, the phone then listens for the relevant Java™ class to be broadcast. When the phone detects the selected Java™ class the software is downloaded and installed. The menu entries now indicate that the service is loaded and available for use. The subscriber can now choose to enable the service. Upon selecting the enabling option an authentication conversation is initiated between the phone and the network operator. The network operator then sends an authorisation code to the subscriber and arranges for the subscriber to be billed for the service. The authorisation may be on a subscription of pay-per-use basis. The subscriber is now able to use the selected service.

As will be appreciated by those skilled in the art, various modifications may be made to the embodiment hereinbefore described without departing from the scope of the present invention.

As will be appreciated other mobile telecommunications devices then a phone can be used, such as PDA's or Global Positioning Systems (GPS), and are hereby incorporated within the scope of the present invention.

CLAIMS

1. Method for downloading software to a mobile telecommunications device said method including the steps of:

broadcasting said software,

receiving and downloading said software to said mobile telecommunications device,

contacting a network operator responsible for said broadcasting, and

causing said network operator to enable said software such that said software is available for use by a user of said mobile telecommunications device.

2. Method as claimed in Claim 1, wherein said step of broadcasting said software is in digital form.

3. Method as claimed in Claims 1 or 2, wherein said step of contacting a network operator responsible for said broadcast is via an existing point to point connection.

4. Method as claimed in Claim 3, wherein said step of causing said network operator to enable said software includes a further step of billing said user for said software via said existing point to point connection.

5. Method as claimed in Claims 3 or 4, wherein said step of contacting a network operator responsible for said broadcast is via an existing GSM connection.

6. Method as claimed in any preceding Claim, wherein said software is developed using a platform independent object code.

7. Method as claimed in Claim 6, wherein said platform independent object code is Java™.

8. A method for downloading software to a mobile telecommunications device as hereinbefore described with reference to the accompanying drawing.

The Patent Office

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INVESTOR IN PEOPLE

Application No: GB 9909617.4
Claims searched: 1 to 8

Examiner: Glyn Hughes
Date of search: 1 November 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): H4L (LECC, LDPP)

Int Cl (Ed.6): H04Q 7/22, 7/32

Other: Online: WPI, JAPIO, EPODOC

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A, E	GB 2334181 A (NEC)	-

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.